

SPECIES GUIDE FOR WETLANDS PLANTINGS

SCIENTIFIC NAME, AUTHOR: *Spartina pectinata* Link

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FAMILY NAME: Poaceae (Grass Family)

TRIBE: Chlorideae

SYMBOL: SPPE

COMMON NAME (s): prairie cordgrass

PLANT TYPE: Native warm-season, tall coarse, perennial.

WETLAND INDICATOR STATUS: FAWC

BENEFIT, VALUES, USES, CAUTIONS:

Prairie cordgrass usually is found growing in marshy meadows, along swales, and in ditches that tend to remain wet. It grows best on deep, wet, lowland soils although it will grow on a wide range of soils, tolerating some fairly droughty sites. Cordgrass is a grass of fresh water marshes, although there are stands which extend into brackish marshes along the Atlantic Coast (Looman, 1983). Warren et al. (1985) reported on the cellular based salt tolerance of *Spartina pectinata* and indicated that it also has a system of salt glands similar to those found on halophytic plants.

Shoot growth development begins early in the spring from perennial sod, Cordgrass grows rapidly from late spring through summer and often reaches a mature height of 5 to 7 feet (Weaver, 1954).

Beneath these mature plants the surface 6 to 10 inches of soil is filled with a mat of coarse, thick, much branched rhizomes. Because of this extensive rhizome system this species always forms a dense sod that readily protects soil from erosion.

This species has a very coarse, rather poorly branched, but very deep root system. The roots spread very little, but penetrate almost vertically downward to depths of 8 to 13 feet (Weaver, 1954).

Lateral root branches are thread-like and very abundant, but only about 1 to 3 inches long and poorly rebranched.

Prairie cordgrass produces abundant early forage, but is not readily grazed if other choices are available. Large quantities are cut for hay in central Manitoba, but the hay requires supplements to keep livestock healthy (Looman, 1983).

Many states require a valid collection permit and permission from the landowner before collecting seed and/or plants is allowed.

PLANT CHARACTERISTICS

General plant description:

Mature plants of cordgrass are tall with a coarse, thick, woody system of rhizomes. Rhizome production begins early in the summer, and may attain a length of 1 foot or more by autumn. Leaves are wide at their base and converge to a pointed tip. Their margins are serrate and as the leaves dry up the edges roll inward to form a tube. The name *Spartina* probably refers to the tough rolled leaves since the Greek word *spartine* means a cord. The sheath is open and distinctly veined and the ligule is a ring of fine hairs. The inflorescence is a panicle of 6 to many spike primary branches. Spikelets are sessile, one flowered and arranged in two rows on two sides of a three angled rachis.

Botanical description:

Coarse rhizomatous perennial, rhizomes 4-8 mm thick with closely imbricate scales; culms usually solitary, tall, erect, glabrous; sheaths smooth to slightly striate, often keeled above, glabrous, sometimes pilose at the upper margins; ligule a relatively long fringe

of hairs 2-3 mm long; blades flat, becoming involute in drying, glabrous on both sides, the margins scabrous; panicles long of 5-15 appressed to somewhat spreading spikes; spikelets densely crowded, 40-80 per spike, each 1-flowered; glumes large, glabrous to sparsely hispidulous, the keel pectinate, the first glume long, narrow, sometimes subulate, 1-nerved, aristate, the second glume greatly exceeding the lemma, 10-20 mm long, including the awn, narrow-lanceolate, 3-nerved, the lateral nerves close to the mid nerve, the awn 3-5 mm long; lemma long, lanceolate, 1-nerved, margins hispidulous; palea thin, papery, exceeding the lemma by about 1 mm, 2-nerves close together; anthers 4-6 mm long (Cronquist, et al., 1977).

LIFE HISTORY INFORMATION

Physiological tolerances:

pH range:

salinity range:

Noted by several authors to be somewhat tolerant of saline conditions (Leithead et al. 1971; Warren et al. 1985; Looman, 1983).

Tissue culture studies indicate that at the cellular level cordgrass is quite tolerant to high NaCl concentrations (Warren et al. 1985).

Whole plant tolerance was not correlated with laboratory work in this study.

water depth range:

When growing in shallow water, many fine roots and much branching can occur. Similar to roots of other plants of swamps and marshes, cordgrass has large air-conducting spaces in the root cortex (Weaver, 1954).

photosynthetic pathway:

Prairie cordgrass has the C4 metabolic pathway which fixes carbon dioxide (Waller and Lewis, 1979; Downton, 1975).

flowering date:

Inflorescence expression and anthesis occur from mid July to mid August at Manhattan, Kansas. These dates will probably differ with latitudinal changes of this widespread species.

fruiting date:

seed dispersal mechanism:

Seed shatters as it matures in the inflorescence. Reproduction by seed may be a secondary or long range dispersal method since the plant is so vegetatively aggressive.

Because of its tall growth in dense pure stands, light values near the soil surface are only 1 to 3% of full sunlight.

Seedlings are not very shade tolerant and reproduction, except in open areas, is undoubtedly almost entirely by rhizomes and tillers (Weaver, 1954).

germination requirements:

GENETIC CHARACTERISTICS

chromosome number:

Basic chromosome number, $X=10$ (Gould and Shaw, 1983; Mobberly, 1956).

hybridization:

remarks:

HABITAT

origin/adaptation:

Prairie cordgrass is widespread in wet areas throughout the United States except in the extreme southeast and southwest (Stubbendieck, et al 1982). It is common in the interlake region in Manitoba and a few

small stands occur in Saskatchewan (Looman, 1983). Cordgrass is a dominant in wet lowlands throughout the true prairie (Gould and Shaw, 1983).

In an idealized transect along a topographic-moisture gradient from the wettest lowlands to the dry uplands, prairie cordgrass, switchgrass, big bluestem, indiangrass, little bluestem, and sideoats grama are encountered (Estes, et al. 1982). In this situation within-community diversity is low and dominance by one or two species is high (Estes, et al. 1982).

native range by MLRA:

climate needs/hardiness:

Apparently fairly hardy since the species exists and is utilized in Canada for some early spring grazing and cut for hay in central Manitoba (Looman, 1983).

rainfall amount/distribution needs:

soils needs:

topography needs:

cohabiting species:

Exists in areas as a virtual monoculture due to vegetative aggressiveness and dense shade provided by abundant foliage production.

NURSERY AND SEEDLING PRODUCTION

seeds and fruits:

Not considered a high seed producing species, plus seed shattering can be a problem during maturation. The long term average bulk seed production amount at the Manhattan PMC is 31 pounds per acre.

According to Weaver (1954) cordgrass seeds germinate readily in wet soil and seedlings develop rapidly.

collection methods:

Early fall (mid-October) by hand in small patches or mechanically with a combine if area allows harvesting in this manner.

collection handling/cleaning/storage/shipping:

No special requirements for seed handling or cleaning. Seed storage the same as other warm season grasses in cool and dry environment is ideal. Shipping via parcel post or UPS is acceptable.

No known special seed treatment or requirement for seed propagation.
vegetative methods:

collection methods/handling/storage/shipping:

Collection of rhizomes in the top 6 to 10 inches of soil is the preferred method of vegetative collection. Early spring collection and transplanting directly into desired field or area would be ideal. However, the emphasis should be on early collection since the plant begins growth earlier than most warm season grasses. Fall collection would probably be acceptable too if a person had a cool, moist place to store the rhizomes during the winter months.

Early spring collections can be made and held for later planting if a cool, moist environment is available to retard plant shoot development. Vegetative propagules can be shipped parcel post or UPS if enclosed in plastic bags with moisture retaining material.

plant propagation techniques:

Establishment in fields utilizing rhizomes has been successfully practiced.

FIELD ESTABLISHMENT

seed versus vegetative propagation:

Propagation by either seed or vegetative propagules is successful. However, seed establishment requires you have a source of seed. Presently the best method of stand establishment is by vegetative planting.

propagules available commercially:

A few vendors sell vegetative propagules or plants.

planting techniques:

When dealing with rhizomes it is essential that the growing points are upright when rhizomes are planted.

site preparation:

The planting area should be prepared and worked up, if possible, to discourage weeds during establishment period.

planting date:

Rhizomes should be planted in March or April for best results.

planting method and spacing:

Plant rhizomes about 5 inches deep and 2 feet apart within row. Rows can be 3 to 6 feet apart due to vegetative aggressiveness of this species. Vegetative material should be handled so at all times to be adequately protected from overheating, drying, sunscald or freezing.

watering:

Normally all plantings will be watered when planted. A minimum of 1 gallon of water per linear foot of row or one acre-inch should be applied following planting. Water should be applied during establishment as required to maintain a healthy growing plant population.

PLANTING MANAGEMENT

water depth management:

Doesn't require periodic flooding to maintain the stand, However, optimum growth of individual plants requires availability of large quantities of water.

fertilizer application:

Fertilize according to the results of soil tests for the site.

harvest by burning or mowing:

The common method of harvesting, for forage, is to mow the stand 2 to 3 times a year to keep the vegetation as juvenile as possible and increase its palatability. Plantings at the Manhattan PMC have been burned annually to stimulate seed production with no apparent detrimental effects.

control of undesirable species:

pathogens and diseases:

No economically significant diseases have been noted on the cordgrass to date.

insect pests:

Insect damage during seed development is a serious problem. An insect in the family Olethreutidae, genus Batra, has been identified as a seed predator during its larval stage. Utilization of sevin during anthesis has resulted in good control of this pest. A stem boring insect has been tentatively identified in the order Lepidoptera, genus Eucosma which also affects seed production. The larval stage of this insect moves up the culm and bores through and into the stem just below the inflorescence. Control measures are unknown for this insect pest.

invasion of other plants:

Prairie cordgrass is so aggressive, there are few plants which will invade an established stand.

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